WHAT IS CLAIMED IS:

1. A method for automatically adjusting the flow rate of engine coolant through a heater core in an automobile, comprising:

automatically determining a temperature difference between the temperature of coolant at a first flow rate before the coolant enters a heater core and a temperature of air exiting the heater core; and

automatically increasing the flow rate of the coolant to a second flow rate higher than the first flow rate if the temperature difference is greater than a first predetermined temperature difference.

2. The method of claim 1, wherein the temperature difference is determined by measuring the temperatures of the coolant entering the heater core and the air exiting the heater core.

3. The method of claim 1, wherein the temperature of the coolant at the first flow rate is determined by measuring the temperature of the coolant, and wherein the temperature of the air exiting the heater core is determined by estimating the temperature of the air exiting the heater core.

4. The method of claim 1, further comprising:

after increasing the coolant flow rate from the first coolant flow rate, automatically estimating a temperature difference between the temperature of coolant before the coolant enters the heater core and temperature of air exiting the heater core as if the coolant was at a third flow rate lower than the second flow rate; and

if the estimated temperature difference is less than a second predetermined temperature difference, reducing the flow rate of the coolant to about the third flow rate.

5. The method of claim 4, wherein the first predetermined temperature difference is greater than the second predetermined temperature difference.

6. The method of claim 5, wherein the first predetermined temperature difference is about 20^{O} C.

7. The method of claim 4, wherein the first predetermined temperature difference is about $1/4^{th}$ greater than the second predetermined temperature difference.

8. The method of claim 4, further comprising:

after reducing the flow rate of the coolant to about the third flow rate, automatically determining a second temperature difference between the temperature of the coolant before the coolant enters the heater core and a temperature of air exiting the heater core by measuring the temperatures of the coolant entering the heater core and the temperature of the air exiting the heater core; and

automatically increasing the flow rate of the coolant if the second temperature difference is greater than the first predetermined temperature difference.

9. The method of claim 1, further comprising:

decreasing the flow rate of the coolant from the second flow rate to a third flow rate lower than the second flow rate after the coolant flows at the second flow rate for a predetermined period of time.

10. The method of claim 9, further comprising:

after decreasing the flow rate of the coolant from the second flow rate to the third flow rate, automatically determining a second temperature difference between the temperature of coolant before the coolant enters a heater core and a temperature of air exiting the heater core; and

automatically increasing the flow rate of the coolant if the temperature difference is greater than the first predetermined temperature difference.

11. The method of claim 10, wherein the second temperature difference is determined by measuring the temperatures of the coolant entering the heater core and the air exiting the heater core.

12. A method for automatically controlling the climate in a cabin of an automobile, comprising:

automatically adjusting the flow rate of engine coolant through a heater core according to claim 1; and

providing heated air to the cabin from the heater core.

13. The method of claim 1, wherein the temperature of air exiting the heater core is estimated.

14. The method of claim 13, wherein the estimate for the temperature of air exiting the heater core is based on the percentage of the total conditioned air introduced into the cabin that passes through the heater core.

15. The method of claim 13, wherein the estimate for the temperature of air exiting the heater core is based on a blower speed that blows conditioned air into the cabin.

16. The method of claim 14, wherein the estimate for the temperature of air exiting the heater core is based on the mass flow rate of air passing through the heater core.

17. The method of claim 13, wherein the estimate for the temperature of air exiting the heater core is based on empirical data previously obtained relating to at least one operational parameter of an automobile component affecting coolant flow rate.

18. The method of claim 13, wherein the estimate for the temperature of air exiting the heater core is based on the enthalpy per degree of coolant flowing through the heater core and the enthalpy per degree of air flowing through the heater core.

19. The method of claim 18, wherein the estimate for the temperature of air exiting the heater core is based on a predetermined ratio of the enthalpy per degree of coolant flowing through the heater core and the enthalpy per degree of air flowing through the heater core.

20. The method of claim 19, wherein the predetermined ratio used as a basis to estimate the temperature of air exiting the heater core varies with respect to at least one variable operational parameter of an automobile component affecting coolant flow rate.

21. The method of claim 20, further comprising automatically scaling the ratio based on a percentage of the total conditioned air introduced into the cabin that passes thorough the heater core and a blower speed that blows conditioned air into the cabin.

22. The method of claim 20, wherein the ratio is further based on a percentage of the total conditioned air introduced into the cabin that passes thorough the heater core and a blower speed that blows conditioned air into the cabin.

23. The method of claim 20, wherein the temperature estimate is further based on an effective overall heat transfer coefficient of the heater core.

24. The method of claim 13, wherein the estimate for the temperature of air exiting the heater core is based on a measured temperature of air entering the heater core.

25. The method of claim 13, wherein the estimate for the temperature of air exiting the heater core is based on a measured temperature of coolant entering the heater core

26. The method of claim 13, wherein the estimate for the temperature of air exiting the heater core is based on a heater core distribution factor.

27. A method for automatically adjusting the flow rate of engine coolant through a heater core in an automobile, comprising:

automatically obtaining a value indicative of a mix door position;

automatically obtaining a value indicative of a flow rate of air through the heater core;

automatically obtaining a value indicative of coolant flow rate through the heater core;

automatically measuring the temperature of coolant before the coolant enters the heater core;

automatically measuring the temperature of air before the air passes through the heater core;

automatically determining a temperature of air exiting the heater core based on automatically obtaining a value indicative of a mix door position, automatically obtaining a value indicative of a flow rate of air through the heater core, automatically obtaining a value indicative of coolant flow rate through the heater core, automatically measured temperature of coolant, and automatically measured temperature of air;

automatically determining a temperature difference between the automatically determined temperature of the coolant before the coolant enters the heater core and the automatically determined temperature of air exiting the heater core; and

automatically increasing the flow rate of the coolant if the temperature difference is greater than a predetermined temperature difference.

28. A method for automatically adjusting the flow rate of engine coolant through a heater core in an automobile, comprising:

utilizing an algorithm relating to at least the equation:

$$Tao = [(Tci - (Tci - Tai) \cdot e^{(-UA/Cc \cdot (1+Cc/Ch))}]/(1 + Cc/Ch) \quad (1)$$

where,

Tao = a temperature of air exiting the heater core,

Tci = a temperature of coolant at the inlet of the heater core,

Tai = a temperature of air prior to entering the heater core,

Cc/Ch = a variable ratio of coolant enthalpy per degree and heater core enthalpy per degree, and

UA/Cc = a variable heater core performance parameter based on Cc/Ch;

automatically determining Tao of air passing through the heater core utilizing the algorithm;

automatically determining a temperature difference between the temperature of coolant at a first flow rate before the coolant enters a heater core and Tao; and

automatically increasing the flow rate of the coolant to a second flow rate higher than the first flow rate if the temperature difference is greater than a predetermined temperature difference.

29. The method of claim 28, wherein the value of Cc/Ch used in the algorithm is determined at least based on a blower speed and a coolant flow rate.

30. The method of claim 29, wherein the value of Cc/Ch used in the algorithm is further based on a percentage of air introduced into the cabin that passes through the heater core.

31. A method for automatically controlling the climate in the cabin of an automobile, comprising:

automatically increasing and decreasing the flow rate of coolant entering a heater core based on a temperature difference between the temperature of the coolant before the coolant enters the heater core and the temperature of air exiting the heater core.

32. The method of claim 31, wherein the temperature differences are estimated temperature differences.

33. The method of claim 31, wherein increasing the flow rate of coolant is based on a temperature difference that is determined by measuring the temperatures of the coolant entering the heater core and the air exiting the heater core.

34. The method of claim 31, wherein the temperature of the coolant is determined by measuring the temperature of the coolant, and wherein the temperature of the air exiting the heater core is determined by estimating the temperature of the air exiting the heater core.

35. The method of claim 31, wherein decreasing the flow rate of coolant entering the heater core is based on an estimate of a temperature difference between the temperature of the coolant before the coolant enters the heater core and the temperature of air exiting the heater core that would be present if coolant flow rate is only controlled by at least one of an engine's coolant pump speed and a temperature of an engine in an automobile, the estimate of

temperature difference being less than a predetermined temperature difference.

36. The method of claim 35, wherein the temperature difference between the temperature of the coolant before entering the heater core and the temperature of air exiting the heater core used to base the increase in the flow rate of coolant is greater than, by a predetermined amount, the estimated temperature difference between the temperature of the coolant before the coolant enters the heater core and the temperature of air exiting the heater core used to base the decrease in the flow rate of coolant.

37. The method of claim 31, wherein increasing the flow rate of coolant entering the heater core is performed by activating a supplemental flow function and decreasing the flow rate of coolant entering the heater core is based on an estimate of a temperature difference between the temperature of the coolant before the coolant enters the heater core and the temperature of air exiting the heater core that would be present if the supplemental flow function was deactivated.

38. A coolant flow control device, comprising:

an electronic processor and a memory, wherein the memory stores a value for a first predetermined temperature difference, and wherein the processor is adapted to automatically adjust the flow rate of engine coolant through a heater core in an automobile based on:

an automatically determined temperature difference between the temperature of coolant at a first flow rate before the coolant enters a heater core and a temperature of air exiting the heater core; wherein

the processor is further adapted to automatically command an increase in the flow rate of the coolant to a second flow rate higher than the

first flow rate if the temperature difference is greater than the stored value for a first predetermined temperature difference.

39. The device of claim 38, wherein the processor is further adapted to receive signals indicative of temperature measurements of the coolant entering the heater core and the air exiting the heater core, and wherein the processor is adapted to use the received signals to automatically determine the temperature difference between the temperature of coolant before the coolant enters a heater core and a temperature of air exiting the heater core.

40. The device of claim 38, wherein the processor is further adapted to:

receive a signal indicative of a temperature measurement of the coolant entering the heater core at the first flow rate; and

estimate the temperature of the air exiting the heater core.

41. The device of claim 38, wherein the memory further stores a value for a second predetermined temperature difference, and wherein the processor is further adapted to:

automatically estimate a temperature difference, after issuing the command to increase the coolant flow rate from the first coolant flow rate to the second coolant flow rate, between the temperature of coolant before the coolant enters a heater core and the temperature of air exiting the heater core as if the coolant was at a third flow rate lower than the second flow rate; and

issue a command to reduce the flow rate of the coolant to about the third flow rate if the estimated temperature difference is less than the stored value of the second predetermined temperature difference.

42. The method of claim 41, wherein the stored value of the first predetermined temperature difference is greater than the stored value of the second predetermined temperature difference.

43. The device of claim 41, wherein the processor is further adapted to:

automatically determine a second temperature difference, after issuing the command reducing the flow rate of the coolant to about the third flow rate, between the temperature of the coolant before the coolant enters the heater core and a temperature of air exiting the heater core based on measured temperatures of the coolant entering the heater core and the temperature of the air exiting the heater core; and

automatically issuing a command to increase the flow rate of the coolant if the second temperature difference is greater than the stored value of the first predetermined temperature difference.

44. The device of claim 38, further comprising:

a timer; wherein

the memory further stores a value for a predetermined period of time; and wherein

the processor is further adapted to issue a command to decrease the flow rate of the coolant from the second flow rate to a third flow rate lower than the second flow rate after the coolant flows at the second flow rate for a period of time measured by the timer greater to or equal to the value of the predetermined period of time stored in the memory.

45. The device of claim 44, wherein the processor is further adapted to:

automatically determine a second temperature difference, after issuing the command to decrease the flow rate of the coolant from the second flow rate to the third flow rate, between the temperature of coolant before the coolant enters the heater core and the temperature of air exiting the heater core; and

automatically issue a command to increase the flow rate of the coolant if the automatically determined temperature difference is greater than the stored value of the first predetermined temperature difference.

46. An apparatus for automatically controlling the climate in a cabin of an automobile, comprising:

a coolant flow control device according to claim 38, wherein the heater core is adapted to supply heated air to the cabin to achieve a desired interior temperature.

47. The apparatus of claim 46, wherein the coolant flow control device comprises an auxiliary pump.

48. An automobile having the device of claim 38.

49. A coolant flow device, comprising:

an electronic processor and a memory, wherein the memory stores a value of a predetermined temperature difference and at least one algorithm based on an equation to automatically determine the temperature of air exiting a heater core, the equation being based on variables including:

a temperature of air exiting the heater core,

a temperature of coolant at the inlet of the heater core,

a temperature of air prior to entering the heater core,

a variable ratio of coolant enthalpy per degree and heater core enthalpy per degree, and

a variable heater core performance parameter based on Cc/Ch; wherein

the electronic processor is adapted to:

automatically determine the temperature of air leaving the heater core utilizing the algorithm,

automatically determine a temperature difference between the temperature of coolant at a first flow rate before the coolant enters the heater core, and

automatically issue a command to increase the flow rate of the coolant to a second flow rate higher than the first flow rate if the temperature

difference is greater than the stored value of the predetermined temperature difference.

50. The device of claim 49, wherein the memory stores a plurality of values of Cc/Ch relating to a blower speed and coolant flow rate, and wherein the processor is adapted to select a value of Cc/Ch based on an inputted blower speed and an inputted coolant flow rate.

51. The method of claim 49, wherein the memory stores a plurality of values of Cc/Ch relating to a blower speed, coolant flow rate, and a percentage of air introduced into the cabin that passes through the heater core, and wherein the processor is adapted to select a value of Cc/Ch based on an inputted blower speed, an inputted coolant flow rate, and an imputed percentage of air introduced into the cabin that passes through the heater core.

52. A program product for automatically adjusting the flow rate of engine coolant through a heater core in an automobile, comprising machine-readable program code for causing, when executed, a machine to perform the following method actions:

automatically determining a temperature difference between the temperature of coolant at a first flow rate before the coolant enters a heater core and a temperature of air exiting the heater core; and

automatically increasing the flow rate of the coolant to a second flow rate higher than the first flow rate if the temperature difference is greater than a first predetermined temperature difference.

53. The program product of claim 52, further causing, when executed, a machine to perform the following method actions:

after increasing the coolant flow rate from the first coolant flow rate, automatically estimating a temperature difference between the temperature of

coolant before the coolant enters a heater core and temperature of air exiting the heater core as if the coolant was at a third flow rate lower than the second flow rate; and

if the estimated temperature difference is less than a second predetermined temperature difference, reducing the flow rate of the coolant to about the third flow rate.

54. The method of claim 31, wherein decreasing the flow rate of coolant entering the heater core is based on an estimate of a temperature difference between the temperature of the coolant before the coolant enters the heater core and the temperature of air exiting the heater core that would be present if coolant flow rate is only controlled by the the engines normal coolant pump, the estimate of temperature difference being less than a predetermined temperature difference.

55. The method of claim 54, wherein the temperature difference between the temperature of the coolant before entering the heater core and the temperature of air exiting the heater core used to base the increase in the flow rate of coolant is greater than, by a predetermined amount, the estimated temperature difference between the temperature of the coolant before the coolant enters the heater core and the temperature of air exiting the heater core used to base the decrease in the flow rate of coolant.